

CONDITIONS ATTENDING THE PERIOD OF HIGH TEMPERATURE AND DROUGHT IN THE VICINITY OF ABILENE, TEX., DURING THE SUMMER OF 1913.

By W. H. GREEN, Observer.

The present drought, so far as its effects upon the staple crops of the State are concerned, is, in the opinion of several reliable men who have been all over the country, the most severe of any drought in this vicinity since the establishment of the Weather Bureau station in Abilene.

The following, according to the Weather Bureau records, are the most noted droughts of this vicinity: May 31 to August 31, inclusive, 1901, total rainfall 1.09 inches; May 20 to July 13, inclusive, 1910, total rainfall 1.09 inches; May 1 to July 12, inclusive, 1911, total rainfall 0.82 inches; June 19 to July 31, inclusive, 1912, total rainfall 0.30 inches; June 29 to September 9, inclusive, 1913, total rainfall 1.29 inches.

It will be noted from the above that the rainfall has been less, for the same length of time, during the growing season of some other years than during the present year; but the drought during the present year began from 3 to 6 weeks later than usual and yet early enough to seriously damage all staple crops, and so far, September 10, it has lasted from 10 to 20 days later than usual, so that late or fall crops will be almost total failures.

It is estimated by parties believed to be qualified to make such estimates, that the small grain crop, wheat, oats, etc., was about 65 per cent below the average or normal, the feed crop about 50 per cent below the normal, and that the cotton crop will be about 65 per cent below the normal.

The water supply in this section is perhaps more plentiful than during some former droughts, due to the fact that the people have better prepared themselves for such conditions by installing surface tanks, etc. I am informed that there are but few farmers who have not a reasonably plentiful supply of stock water, and that no one in this vicinity is having to drive stock any great distance to water.

The heat has not been especially severe during the present drought, although with a few exceptions moderately high temperatures have obtained since the 1st of July. On July 26 the mean temperature was 9° below the normal, and there have been seven other days since the 1st of July when the temperature was slightly below the normal.

NOTES ON THE HEAT AND DROUGHT OF 1913 AT FORT WORTH, TEX.

By D. S. LANDIS, Local Forecaster.

At Fort Worth, Tex., no rain in excess of a trace occurred during the period from July 28 to September 6, a period of 40 days. During the same time the maximum temperature was above 90° each day, and on 8 days it was 100° or over. The highest temperature reached was 104° on September 5, being the highest September temperature on record at this station.

Effects.—The staple product, cotton, was depreciated to one-half a crop as compared with 1912, and all other products suffered at least half depletion and more in many instances, dependent upon soil and position. Water in all places showed a comparatively lower level than had been noted in any previous record on file. Wells that had never failed before were reported almost water-

less, and stock suffered much, having to be driven once a day several miles for water. Grass is dried and powdery, and stock are existing on the short hay incident to this region when subjected to drought, thus promising losses during the coming winter in connection with a prospective continued shortage in water. Corn failed entirely, and gardens were short lived and less than half in productions. The loss in trees and shrubbery is heavy, probably 25 per cent being ruined.

While 1913 had a severer drought than usual, it also suffered from the cumulative effect of deficient rainfall, as the soil has not been thoroughly wetted deep down since 1908, the intervening years being very dry, with the exception of 1912, which was a surface-season year in general.

The mean temperature for 1913, July and August, was not unusual, it being exceeded in the years 1896, 1897, 1899, and 1902.

Drought comparisons show that 1913 had 40 days with only a trace of rain, while 1899 had but a trace from July 26 to September 16, a period of 52 days. The year 1909 had a drought of 43 days, lasting from June 26 to August 8, with but 0.03 precipitation.

Since the drought of 1913 was cumulative, it was the severest on record in its effect upon growing crops and otherwise. Agricultural products are not more than one-half the usual; an unprecedented scarcity of water both for stock and man exists; and there is such a paucity of winter roughness for stock that the loss of life must be immense, since the animals are now poor and water starved. Suffering from great heat was not of importance, since the lack of humidity, and brisk winds at night most of the time permitted more comfort and rest than under damper conditions and less wind movement. The uppermost problem at this writing, September 9, is water for both man and beast.

DROUGHT OF 1913 IN EASTERN TEXAS.

By WALTER B. HARE, Observer, Palestine, Tex.

The drought of the present summer season in eastern Texas was one of the most prolonged, as well as one of the most disastrous, in the climatological history of this section.

During the months of January, February, March, and April the precipitation averaged only slightly below the normal, being 0.42 inch below the normal in January, 0.18 inch in excess of the normal in February, 0.78 inch below in March, and 0.78 inch below in April. Good, soaking rains occurred on March 9, March 12-13, April 3, April 8-9, and April 22. The spring showers acted directly on the young cotton plants, producing a copious supply of sap and noticeably advancing the plant growth. The month of May was also favorable up to the 22d, beneficial showers falling on the 4th-5th, the 15th-16th, and the 20th. The total rainfall for May was 2.83 inches, or 2.06 inches below the normal.

On May 22 the first dry period of the season set in and lasted until June 9-18 days. A fairly good rain, 0.78 inch, occurred on June 9, but this shower continued for only three hours and was by no means the slow, long-continued, copious rain needed at this critical stage of cotton-plant growth. Other light, short showers occurred during the month, and half an inch fell on June 28, but again the shower was of short duration and was rapidly dissipated as surface water.

On July 2, 0.68 inch of rain fell in two showers. This rainfall was slow and steady and probably most of the water penetrated the soil for a few inches, but a rainfall of 0.68 inch was totally inadequate to materially assist a semisandy soil that had been without sufficient moisture since May 20, or for 42 days. Following these showers of July 2 the long drought set in and continued until September 12-13, when a slow, steady rain of over 3 inches relieved the condition. The entire period from May 21 to September 12, 114 days, may be characterized as abnormally dry. The total amount of precipitation for June was 1.51 inches, or 2.44 inches below the normal; for July 0.71 inch, or 2.29 inches below the normal, and in August only 0.23 inch of rain fell. This small amount of rain was 1.99 inches below the August normal, and at the end of August there was an accumulated deficiency since January 1 of 10.63 inches. From May 1 to September 1, the cotton-growing period, the total amount of rainfall at Palestine was 7.80 inches less than the average rainfall for the same period, this being the greatest deficiency during the cotton-growing season since the establishment of the local office of the United States Weather Bureau in 1881.

OTHER METEOROLOGICAL CONDITIONS IN 1913.

Concomitant with the lack of sufficient moisture appears an abnormally high percentage of sunshine and a correspondingly large number of clear days. In April there were 21 clear days, 6 partly cloudy and 3 cloudy days; in May 22 clear, 7 partly cloudy and 2 cloudy; in June 17 clear, 11 partly cloudy, and 2 cloudy; in July 24 clear, 7 partly, and no cloudy; and in August 19 clear, 12 partly cloudy, and again not a single cloudy day. The prevailing winds were from the warm regions of Mexico and from the Gulf of Mexico. Their velocity was less than normal, and cool, bracing winds from the northwest were entirely absent. The intense afternoon heat of the summer months was also an important factor contributing to the damage of the cotton crop. The plant, so well developed by the spring rains, not only lacked sustenance from the soil on account of absence of moisture, but was further desiccated by the abnormally hot rays of the sun. In June a maximum temperature of 90° or above occurred on 11 days, in July on 28 days, and in August on 30 days.

RESULTING EFFECTS.

The cotton crop for 1913 is conservatively estimated at scarcely two-thirds of an average crop, and the sugarcane crop at probably one-half an average crop. Corn is about the average, and the good soaking rains of September 12-13 will materially assist the fall farm products. The water in the reservoirs at Palestine has been at the lowest stage ever known. During the first decade in September the entire supply was discontinued for many hours, and for several days only a very slight stream of muddy water was obtainable, and that only on the ground floors of both residential and business districts, leaving the second-floor baths and toilets without any water at all for four days. Similar conditions are reported from other towns in east Texas, but the heavy rains of September 12-13 alleviated further danger of a water famine.

The loss from the cotton crop in Anderson County will be the heaviest ever known, and is conservatively estimated at over \$75,000 in this county alone.

The drought in 1913 produced an early season for cotton, the first bale being ginned August 7. In 1912 the first bale was ginned August 16. The Palestine Ice, Fuel & Gin Co., the largest ginning company in Anderson County, have ginned 148 bales of cotton up to September 1, 1913. In 1912 they ginned only 86 bales up to September 1, but the president of the company, Mr. W. L. Welborne, states that the 1913 cotton crop will fall behind the 1912 crop by 33½ per cent in spite of a 10 per cent increase in acreage. The decrease will be due to a total lack of late cotton, known as "top crop," as the late plants were entirely destroyed by the heat and drought.

HEAT AND DROUGHT IN SOUTH DAKOTA DURING THE SUMMER OF 1913.

By S. W. GLENN, Section Director.

The heat wave which affected the more southerly States did not prevail in this vicinity until the latter part of August and the first week in September, more especially during the latter period, but there were several periods of three or four days in August with maximum temperatures of 90° or slightly higher.

While there was some quite warm weather in July and August, it was not on the whole more severe than has occurred in some other years. The current September, however, 1st to 6th, is the only September since the opening of the station in which an extended hot period has prevailed. From the 1st to 6th, inclusive, with a break of only two days, maximum temperatures of 100° or higher occurred. From August 10 to 18, there was an average daily excess in mean temperature of 8.1°, from August 25 to 31 an average daily excess of 6.6°, and from September 1 to 6, inclusive, the average daily excess was 15.6°.

August of this year gave the highest mean temperature of any August since the Huron station was opened, except in 1900 and 1909. In some former years hot winds have occurred several times in a season; this year there were four days in September when the winds could be called hot, but there were no others.

Whatever injury was sustained by small grains in this vicinity was largely due to a pronounced deficiency in rainfall in June. The season started out well with a good supply of moisture at the end of May, but June gave about 2.70 inches less than the normal, and at the end of the month there was no excess of moisture in the soil for plant life to draw from. Rains in July were very beneficial for corn, which generally did well up to the latter part of August, and for other late crops. Corn was adversely affected by the heat wave, according to the reports of some persons, while some others report no material damage. The effect of the heat wave was to absorb the moisture of the foliage, while the absence of good rains, and deficient soil moisture, aided in the process.

When the heat wave started in, small grains were being harvested, and corn was far advanced toward maturity, but the dry heat hastened its ripening, and doubtless this crop was hurt by the weather conditions, forcing it to early maturity, but how much it was damaged is hard to determine as yet.

As compared with other years, this vicinity, as well as the State, has on the whole experienced more unfavorable crop seasons several times, in my judgment and that of others competent to give an opinion.